637.2
L41

THE

VALUATION OF THE MANURES

OBTAINED BY THE

CONSUMPTION OF FOODS

FOR THE

PRODUCTION OF MILK.

BY

SIR JOHN BENNET LAWES, Bart., LL.D., F.R.S.

AND

SIR J. HENRY GILBERT, LL.D., F.R.S.

FROM THE

JOURNAL OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND,

THIRD SERIES, VOL. IX. PART I. 1898, PP. 103–117.

Printed by

SPOTTISWOODE & CO., NEW-STREET SQUARE, LONDON.

1898.

637.2
L41

THE VALUATION OF THE MANURES OBTAINED BY THE CONSUMPTION OF FOODS FOR THE PRODUCTION OF MILK.

After the publication in 1885 of our paper in this Journal on "*The Valuation of Unexhausted Manures*," in which we limited our illustrations to cases of the manures obtained by the consumption of foods for the production of fattening increase, we were asked if we could not supply a scale applicable to the consumption of foods for the production of milk. Again, since the publication of our revised valuations in the last issue of the Journal,[1] we have been asked the same question. In answer, we in each case pointed out how such an estimate could approximately be arrived at. There are, however, considerable difficulties in extending the valuations to meet the requirement in the case of milk-production, as will be fully appreciated as we proceed. After careful consideration of the subject we have, however, arranged tables of valuation of the manure obtained when food is consumed for the production of milk, substantially on the plan of those previously given in the case of the production of fattening increase.

In illustration of the complexity and difficulty of the subject, it will be of interest to recall attention here to illustrations we have previously given, of the great difference in the demands made upon the food, on the one hand for the production of animal increase, and on the other for the production of milk. As is well known, not only do cows of different breeds yield widely different quantities of milk, and in some cases milk of characteristically different composition, but individual animals of the same breed have very different milk-yielding capacity; and whatever the average capacity of a cow may be, she has a maximum yield at one period of her lactation, which is followed by a gradual decline. Hence, in comparing the amounts of constituents stored up in the fattening increase of an ox with the amounts of the same constituents removed in the milk of a cow, we must assume a wide range of difference in the yield of milk.

[1] Journal R.A.S.E., 3rd series, vol. viii. 1897, part iv. p. 674.

p 686

Table I. shows the amounts—of nitrogenous substance, of fat, of non-nitrogenous substance not fat, of total mineral matter, of phosphoric acid, of potash, and of total solid matter, carried off in the weekly yield of milk of a cow, on the alternative assumptions of a produce of 4, 6, 8, 10, 12, 14, 16, 18, or 20 quarts, per head per day; and, for comparison, there are given at the bottom of the Table the amounts—of nitrogenous substance, of fat, of total mineral matter, of phosphoric acid, of potash, and of total solid matter, in the weekly increase in live-weight of a fattening ox, of an average weight

TABLE I.—*Comparison of the Constituents of Food carried off in Milk, and in the Fattening Increase of Oxen.*

[1 Gallon = 10·33 lb.]	Nitrogenous substance	Fat	Non-nitrogenous substance not fat (sugar)	Total mineral matter (ash)	Phosphoric acid	Potash	Total solid matter
IN MILK PER WEEK.							
If:—	lb.	lb.	lb.	lb.	lb.	lb.	lb.
4 quarts per head per day	2·64	2·53	3·33	0·54	0·1566	0·1350	9·04
6 " "	3·96	3·80	4 99	0·81	0·2349	0·2025	13·56
8 " "	5·28	5·06	6·66	1·08	0·3132	0·2700	18·08
10 " "	6·60	6·33	8·32	1·35	0·3915	0·3375	22·60
12 " "	7·92	7·59	9·99	1·62	0·4698	0·4050	27·12
14 " "	9·24	8·86	11·65	1·89	0·5481	0·4725	31·64
16 " "	10·56	10·12	13·32	2·16	0·6264	0·5400	36·16
18 " "	11·88	11·39	14·98	2·43	0·7047	0·6075	40·68
20 " "	13·20	12·65	16·65	2·70	0·7830	0·6750	45·20
IN INCREASE IN LIVE-WEIGHT PER WEEK (OXEN).							
If 10 lb. increase .	0·80	6·35	—	0·20	0·086	0·011	7·35
If 15 lb. increase .	1·20	9·53	—	0·30	0·129	0.0165	11·03

of 1,000 lb.—first on the assumption of a weekly increase of 10 lb., and secondly of 15 lb.

The estimates of the amounts of constituents in the milk are based on the assumption that it will contain 12·5 per cent. of total solids, consisting of 3·65 albuminoids, 3·50 butter-fat, 4·60 sugar, and 0·75 total mineral matter; the last containing 0·22 (0·2175) phosphoric acid, and 0·19 (0·1875) potash. The estimates of the constituents in the fattening increase of oxen are founded on determinations made at Rothamsted. On this point it may be added, that the amounts of nitrogenous substance in the animal increase are slightly raised from the original estimate, first published in 1885, and they now accord with that

adopted in our valuation tables published in 1885, and again in 1897. The amount of total mineral matter in the increase is also somewhat raised from the original estimate; partly from the consideration that, with earlier maturity, the so-called fattening increase will contain more of growth, and hence somewhat more of both nitrogen and mineral matter, than was assumed in our earlier adopted average estimates.

Referring to the very wide range of yield of milk per head per day which the figures in the Table assume, it may be remarked that it is by no means impossible that the same animal might yield the largest amount—namely, 20 quarts, or 5 gallons, per day, near the beginning, and only 4 quarts, or 1 gallon, or even less, towards the end of her period of lactation. At the same time, a moderately large herd of, say Shorthorns or Ayrshires, of fairly average quality, well fed, and including animals of various periods of lactation, should not yield an average of less than 8 quarts, or 2 gallons, and would seldom exceed 10 quarts, or 2½ gallons, per head per day, the year round.

For the purposes of illustration, we will assume an average yield of milk of 10 quarts, equal 2½ gallons, or between 25 and 26 lb. per head per day; and compare the amount of constituents in the weekly yield at this rate, with that in the weekly increase of the fattening ox at the higher rate assumed in the Table—namely, 15 lb. per 1,000 lb. live-weight, or 1·5 per cent., per week.

Thus, of the nitrogenous substance of the food, the amount stored up in the fattening increase of the ox will be only 1·2 lb., but the amount carried off as such in the milk would be 6·6 lb, or 5½ times as much as in the increase. Of mineral matter, again, the fattening increase would not contain more than 0·3 lb.; whilst the milk would carry off 1·35 lb. or 4½ times as much; of phosphoric acid, the increase would contain 0·129 lb. and the milk 0·3915 lb. or more than 3 times as much; and of potash, the fattening increase would contain 0·0165 lb., but the milk 0·3375 lb., or more than 20 times as much.

Although the fact has no bearing on our present estimates, it is of interest to observe that, whilst the fattening increase would contain 9·53 lb. of fat, the milk would contain only 6·33 lb., or only about two-thirds as much. On the other hand, whilst the fattening increase contains practically no other non-nitrogenous substance besides fat, the milk would carry off 8·32 lb. in the form of milk-sugar. It may be added, that this amount of milk-sugar reckoned as fat would correspond approximately to the difference between the fat in the milk and that in the fattening increase.

From the foregoing comparisons, it is evident that the drain upon the food is very much greater for the production of milk than for that of meat; leaving, therefore, correspondingly smaller amounts of the constituents consumed remaining for manure. This is especially the case in the important item of nitrogenous substance; and if, as is frequently assumed, the butter-fat of the milk is, at any rate to a great extent, primarily derived from the nitrogenous substance of the food, so far as it is so, about two parts of such substance would be required to produce one of fat. On such an assumption, therefore, the requirement for nitrogenous substance of food would be much greater than that indicated in the Table (I.) as existing as nitrogenous substance in the milk. But the nitrogen of any amount of nitrogenous substance so utilised for the production of fat would nevertheless be recovered in the manure.

Independently, however, of the difficulty of estimating the average value of the manure derived from the consumption of food for the production of milk, arising from the very wide difference in the amount of milk yielded by different cows, or by the same cow at different periods of her lactation, our knowledge as to the difference in the amount of the food actually consumed by the animal coincidently with the production of such different amounts of milk, is far from definite and trustworthy. The difference in the amounts of consumption in relation to production will, however, be much less, and will less materially vitiate estimates of manure-value in the case of herds; especially if the individuals are selected with ordinary judgment as to milk-yielding capacity, and period of lactation, and if the feeding is also managed with judgment, under the guidance of experience.

Although information is wanting to enable us to connect, with numerical accuracy, the great differences in milk-yield of individual cows with the coincident differences in consumption to produce it, it may be considered as satisfactorily established, by the results of ourselves and others in this country, that more food is consumed by a herd of cows to produce a fair yield of milk, of say 8 or 10 quarts per head per day, than by an equal live-weight of oxen fed to produce fattening increase.[1] In the cases supposed, it may, for practical purposes, be assumed that

---

[1] In making the above statement, we are fully aware that in Wolff's *Tables of Standard Rations*, he assumes that milch cows will consume less total dry matter of food, and also less of digestible nitrogenous substance, non-nitrogenous substance, and total organic substance, for a given live-weight per day than fattening oxen. This is, however, certainly not the case with fairly well-bred and liberally fed cows in this country, giving good yields of milk.

the cows would consume about one-fourth more food than the oxen. Accordingly, in our estimates of the value of the manure obtained on the consumption of food for the production of milk, we have assumed that one-fourth more will be consumed by 1,000 lb. live-weight of cows than by the same weight of oxen; but the estimates of the amounts of the constituents of the food removed in the milk, or remaining for manure, are nevertheless reckoned per ton of each food consumed, as in the case of those relating to feeding for the production of fattening increase. It may be added, that the calculations of the amounts of the constituents in the milk are based on the same average composition of milk as is adopted in the construction of Table I. (p. 4), and described in detail in the letterpress at pp. 4–5. Thus, the nitrogen is taken at 0·579 (=3·65 nitrogenous substance) per cent., the phosphoric acid at 0·2175 per cent., and the potash at 0·1875 per cent., in the milk.

Table II. (pp. 8–9) shows in detail the estimate of the amount of nitrogen in one ton of each food, and in the milk produced from its consumption, on the assumption of an average yield of 10 quarts per head per day; also the amount remaining for manure the amount of ammonia corresponding to the nitrogen, and the value of the ammonia at 4*d.* per lb. Similar particulars are also given in relation to the phosphoric acid and the potash, consumed in the food, removed in the milk, and remaining for manure, &c. This table will serve as a sufficient illustration of the mode of estimating the *total or original* value of the manure, derived from the consumption of the different foods for the production of milk in the case supposed; that is assuming an average yield of a herd of 10 quarts per head per day.

We have, however, made similar detailed calculations of the *total or original* manure-value (as in Table II. for 10 quarts), on the alternative assumptions of a yield of 6, 8, 12, and 14 quarts, per head per day; and, so far as the estimates of the *total or original manure-value* are concerned, the results for the various amounts of milk-yield are given in Table III. (p. 10). For comparison there is also given, in the first column, the estimate of the *total or original* manure-value when the foods are consumed for the production of fattening increase.

So much for the plan and results of the estimations of the *total or original* manure-value of the different foods, that is deducting only the constituents removed in the milk, and reckoning the remainder at the prices at which they can be purchased in artificial manures. With a view to direct application to practice, however, we have now to endeavour to estimate the

[*continued on p.* 11

TABLE II.—*Estimates of the Total or Original Manure-value of Milk. Valuations on the assumption of an average pro-*

Nos.	Description of food	Nitrogen				
		In 1 ton of food	In milk from 1 ton of food	In manure		
				Total remaining for manure	Nitrogen equal ammonia	Value of ammonia at 4*d.* per lb.
		lb.	lb.	lb.	lb.	£ s. d.
1	Linseed	80·64	25·04	55·60	67·52	1 2 6
2	Linseed cake . . .	106·40	20·86	85·54	103·87	1 14 7
3	Decorticated cotton cake	147·84	19·27	128·57	156·13	2 12 1
4	Palm-nut cake . .	56·00	17·86	38·14	46·31	0 15 5
5	Undecorticated cotton cake	84·00	15·66	68·34	82·99	1 7 8
6	Cocoa-nut cake . .	76·16	15·66	60·50	73·47	1 4 6
7	Rape cake . . .	109·76	12·50	97·26	118·11	1 19 4
8	Peas	80·64	17·86	62·78	76·24	1 5 5
9	Beans	89·60	17·86	71·74	87·12	1 9 0
10	Lentils	94·08	17·86	76·22	92·56	1 10 10
11	Tares (seed) . . .	94·08	17·86	76·22	92·56	1 10 10
12	Indian corn . . .	38·08	17·38	20·70	25·14	0 8 5
13	Wheat	40·32	17·38	22·94	27·86	0 9 3
14	Malt	38·08	17·86	20·22	24·55	0 8 2
15	Barley	36·96	17·38	19·58	23·78	0 7 11
16	Oats	44·80	16·68	28·12	34·15	0 11 5
17	Rice meal . . .	42·56	16·68	25·88	31·43	0 10 6
18	Locust beans . . .	26·88	13·90	12·98	15·76	0 5 3
19	Malt coombs . . .	87·36	15·66	71·70	87·07	1 9 0
20	Fine pollard . . .	54·88	16·68	38·20	46·39	0 15 6
21	Coarse pollard . .	56·00	15·66	40·34	48·99	0 16 4
22	Bran	56·00	13·90	42·10	51·12	0 17 0
23	Clover hay . . .	53·76	8·94	44·82	54·43	0 18 2
24	Meadow hay . . .	33·60	8·36	25·24	30·65	0 10 3
25	Pea straw . . .	22·40	7·83	14·57	17·69	0 5 11
26	Oat straw . . .	11·20	6·95	4·25	5·16	0 1 9
27	Wheat straw . . .	10·08	5·98	4·10	4·98	0 1 8
28	Barley straw . . .	8·96	5·46	3·50	4·25	0 1 5
29	Bean straw . . .	20·16	5·68	14·48	17·58	0 5 10
30	Potatoes	5·60	2·07	3·53	4·29	0 1 5
31	Carrots	4·48	1·46	3·02	3·67	0 1 3
32	Parsnips	4·93	1·67	3·26	3·96	0 1 4
33	Mangel wurzels . .	4·93	1·32	3·61	4·38	0 1 6
34	Swedish turnips . .	5·60	1·14	4·46	5·42	0 1 10
35	Yellow turnips . .	4·48	0·93	3·55	4·31	0 1 5
36	White turnips . .	4·03	0·84	3·19	3·87	0 1 3

Cattle Foods after Consumption by Cows for the Production of duction by a herd, of 10 *quarts of milk per head per day.*

Phosphoric Acid					Potash					Total or original manure-value per ton of food consumed		
In 1 ton of food	In milk from 1 ton of food	In manure			In 1 ton of food	In milk from 1 ton of food	In manure					
		Total remaining for manure	Value at 2*d.* per lb.				Total remaining for manure	Value at 1½*d.* per lb.				
lb.	lb.	lb.	*s.*	*d.*	lb.	lb.	lb.	*s.*	*d.*	£	*s.*	*d.*
34·50	9·34	25·16	4	2	30·69	8·02	22·67	2	10	1	9	6
44·80	7·79	37·01	6	2	31·36	6·71	24·65	3	1	2	3	10
69·44	7·18	62·26	10	5	44·80	6·22	38·58	4	10	3	7	4
26·88	6·68	20·20	3	4	11·20	5·73	5·47	0	8	0	19	5
44·80	5·85	38·95	6	6	44·80	5·07	39·73	5	0	1	19	2
31·36	5·85	25·51	4	3	44·80	5·07	39·73	5	0	1	13	9
56·00	4·69	51·31	8	7	33·60	4·09	29·51	3	8	2	11	7
19·04	6·68	12·36	2	1	21·50	5·73	15·77	2	0	1	9	6
24·64	6·68	17·96	3	0	29·12	5·73	23·39	2	11	1	14	11
16·80	6·68	10·12	1	8	15·68	5·73	9·95	1	3	1	13	9
17·92	6·68	11·24	1	10	17·92	5·73	12·19	1	6	1	14	2
13·44	6·50	6·94	1	2	8·29	5·56	2·73	0	4	0	9	11
19·04	6·50	12·54	2	1	11·87	5·56	6·31	0	9	0	12	1
17·92	6·68	11·24	1	10	11·20	5·73	5·47	0	8	0	10	8
16·80	6·50	10·30	1	9	12·32	5·56	6·76	0	10	0	10	6
13·44	6·24	7·20	1	2	11·20	5·40	5·80	0	9	0	13	4
(13·44)	6·24	7·20	1	2	(8·29)	5·40	2·89	0	4	0	12	0
—	5·19	—	—		—	4·42	—	—		—		
44·80	5·85	38·95	6	6	44·80	5·07	39·73	5	0	2	0	6
64·96	6·24	58·72	9	9	32·70	5·40	27·30	3	5	1	8	8
78·40	5·85	72·55	12	1	33·60	5·07	28·53	3	7	1	12	0
80·64	5·19	75·45	12	7	32·48	4·42	28·06	3	6	1	13	1
12·77	3·35	9·42	1	7	33·60	2·94	30·66	3	10	1	3	7
8·96	3·10	5·86	1	0	35·84	2·62	33·22	4	2	0	15	5
7·84	2·91	4·93	0	10	22·40	2·46	19·94	2	6	0	9	3
5·38	2·60	2·78	0	6	22·40	2·29	20·11	2	6	0	4	9
5·38	2·23	3·15	0	6	17·92	1·96	15·96	2	0	0	4	2
4·03	2·04	1·99	0	4	22·40	1·80	20·60	2	7	0	4	4
6·72	2·14	4·58	0	9	22·40	1·80	20·60	2	7	0	9	2
3·36	0·78	2·58	0	5	12·32	0·66	11·66	1	5	0	3	3
2·02	0·54	1·48	0	3	6·27	0·49	5·78	0	9	0	2	3
4·26	0·63	3·63	0	7	8·06	0·49	7·57	0	11	0	2	10
1·57	0·49	1·08	0	2	8·96	0·49	8·47	1	1	0	2	9
1·34	0·44	0·90	0	2	4·93	0·33	4·60	0	7	0	2	7
(1·34)	0·34	1·00	0	2	(4·93)	0·33	(4·60)	0	7	0	2	2
1·12	0·31	0·81	0	2	6·72	0·33	6·39	0	10	0	2	3

TABLE III.—*Comparison of the Estimates of Total or Original Manure-value when Foods are consumed for the Production of Fattening Increase, with those when the Food is consumed by Cows giving different yields of Milk.*

Nos.	Description of food	Total or original manure-value per ton of food consumed—that is, only deducting the constituents in fattening increase or in milk					
		For the production of fattening increase	For the production of milk, supposing the yield per head per day to be as under—				
			6 quarts	8 quarts	10 quarts	12 quarts	14 quarts
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Linseed	1 19 2	1 14 7	1 12 0	1 9 6	1 7 1	1 4 5
2	Linseed cake	2 11 11	2 8 1	2 6 0	2 3 10	2 1 9	1 19 8
3	Decorticated cotton cake	3 14 9	3 11 2	3 9 2	3 7 4	3 5 4	3 3 4
4	Palm-nut cake	1 6 4	1 3 2	1 1 4	0 19 5	0 17 9	0 15 11
5	Undecorticated cotton cake	2 5 3	2 2 4	2 0 8	1 19 2	1 17 6	1 15 11
6	Cocoa-nut cake	1 19 10	1 16 11	1 15 3	1 13 9	1 12 3	1 10 6
7	Rape cake	2 16 5	2 14 2	2 12 11	2 11 7	2 10 4	2 9 1
8	Peas	1 16 5	1 13 1	1 11 2	1 9 6	1 7 8	1 5 9
9	Beans	2 1 11	1 18 7	1 16 10	1 14 11	1 13 1	1 11 4
10	Lentils	2 0 8	1 17 5	1 15 7	1 13 9	1 12 2	1 10 1
11	Tares (seed)	2 1 1	1 17 11	1 16 0	1 14 2	1 12 6	1 10 7
12	Indian corn	0 16 7	0 13 4	0 11 7	0 9 11	0 8 1	0 6 5
13	Wheat	0 18 11	0 15 8	0 13 11	0 12 1	0 10 5	0 8 8
14	Malt	0 17 7	0 14 5	0 12 7	0 10 8	0 9 0	0 7 1
15	Barley	0 17 2	0 14 0	0 12 3	0 10 6	0 8 8	0 6 11
16	Oats	0 19 9	0 16 8	0 15 0	0 13 4	0 11 7	0 9 1
17	Rice meal	(0 18 6)	0 15 5	0 13 9	0 12 0	0 10 5	0 8 [illegible]
18	Locust beans	—	—	—	—	—	—
19	Malt coombs	2 6 7	2 3 9	2 2 0	2 0 6	1 18 11	1 17 4
20	Fine pollard	1 15 2	1 12 0	1 10 5	1 8 8	1 6 11	1 5 3
21	Coarse pollard	1 18 1	1 15 2	1 13 6	1 12 0	1 10 5	1 8 9
22	Bran	1 18 6	1 15 11	1 14 6	1 13 1	1 11 8	1 10 3
23	Clover hay	1 7 0	1 5 5	1 4 5	1 3 7	1 2 8	1 1 8
24	Meadow hay	0 18 7	0 17 0	0 16 3	0 15 5	0 14 5	0 13 7
25	Pea straw	0 12 2	0 10 9	0 10 0	0 9 3	0 8 5	0 7 8
26	Oat straw	0 7 5	0 6 2	0 5 5	0 4 9	0 4 0	0 3 3
27	Wheat straw	0 6 6	0 5 5	0 4 10	0 4 2	0 3 6	0 3 0
28	Barley straw	0 6 5	0 5 6	0 4 10	0 4 4	0 3 9	0 3 2
29	Bean straw	0 11 5	0 10 4	0 9 9	0 9 2	0 8 7	0 8 0
30	Potatoes	0 4 1	0 3 9	0 3 6	0 3 3	0 3 1	0 2 11
31	Carrots	0 2 9	0 2 6	0 2 4	0 2 3	0 2 1	0 1 11
32	Parsnips	0 3 6	0 3 3	0 3 1	0 2 10	0 2 8	0 2 7
33	Mangel wurzels	0 3 2	0 3 0	0 2 10	0 2 9	0 2 7	0 2 5
34	Swedish turnips	0 2 11	0 2 9	0 2 8	0 2 7	0 2 5	0 2 3
35	Yellow turnips	(0 2 6)	0 2 4	0 2 3	0 2 2	0 2 1	0 2 0
36	White turnips	0 2 7	0 2 5	0 2 4	0 2 3	0 2 2	0 2 0

unexhausted manure-value of the different foods, or what may be called their *compensation-value*, after they have been used for a series of years by the outgoing tenant, and he has realised a certain portion of the manure-value in his increased crops. In the calculations we have adopted the same scale of reduction of the manure-value from year to year as in the case of the manure derived from the consumption of the foods for the production of fattening increase; and we must refer to the Section—"*Unexhausted Manure-value of Cattle Foods*"—in our paper in the last number of the Journal, for further comments and arguments on the subject. It will suffice to state here, that the rule is to deduct one-half of the *original manure-value* of the food used the last year, and one-third of the remainder each year to the eighth, in the case of all the more concentrated foods, and the roots; in fact of all the foods in the list excepting the hays and the straws; and for these, which contain larger amounts of indigestible matter, and the constituents of which will be more slowly available to crops, two-thirds of the *original manure-value* is deducted for the last year, and only one-fifth from year to year to the eighth year back.

The results of the estimates of *compensation-value* so made, are given for the five yields of 6, 8, 10, 12, and 14 quarts of milk per head per day respectively, in the five Tables—IV., V., VI., VII., and VIII. (pp. 12–16). In each case, the first column shows the *total or original manure-value* of the food; the second the allowance for the last year, the succeeding seven columns that for each year back to the eighth; and the last column gives the *total compensation-value* for eight years' consumption.

The estimates are thus fully given for a minimum yield of 6, and for a maximum of 14, quarts per head per day; also for the three intermediate amounts of 8, 10 and 12 quarts. The range of the results will, therefore, probably cover all the requirements of valuation in actual practice. It may be added, that amounts intermediate between any two of those provided for in the tables may be obtained by taking the mean of the two.

Although we have thus, in the five Tables IV. to VIII., adopted the same scale of reduction from the *total or original* manure-value from year to year, when food is consumed for the production of milk, as when the consumption is for fattening increase, it must be borne in mind that, when cows are fed in sheds or yards, the manure is generally liable to greater losses than is the case with fattening oxen. The manure from the cow contains much more water in proportion to solid matter than that of the ox. Water will, besides, frequently be used

[*continued on p.* 17

TABLE IV.—*Estimates of the Compensation-value of the Unexhausted Manures when Foods are consumed for the Production of Milk, starting from the Total or Original Manure-value.*

1. Assuming a yield of 6 quarts of milk per head per day.

Foods	Total or original manure-value, deducting constituents in milk only	Compensation-value of unexhausted manures								
		Last year	Second year	Third year	Fourth year	Fifth year	Sixth year	S'v'nth year	Eighth year	Total
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR										
One Ton	£ s. d.	£ s. d.	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.
1. Linseed	1 14 7	0 17 4	0 11 7	7 9	5 2	3 5	2 3	1 6	1 0	2 10 0
2. Linseed cake	2 8 1	1 4 1	0 16 1	10 9	7 2	4 9	3 2	2 1	1 5	3 9 6
3 Decorticated cotton cake	3 11 2	1 15 7	1 3 9	15 10	10 7	7 1	4 9	3 2	2 1	5 2 10
4. Palm-nut cake	1 3 2	0 11 7	0 7 9	5 2	3 5	2 3	1 6	1 0	0 8	1 13 4
5 Undecorticat'd cotton cake	2 2 4	1 1 2	0 14 1	9 5	6 3	4 2	2 9	1 10	1 3	3 0 11
6. Cocoa-nut cake	1 16 11	0 18 6	0 12 4	8 3	5 6	3 8	2 5	1 7	1 1	2 13 4
7. Rape cake	2 14 2	1 7 1	0 18 1	12 1	8 1	5 5	3 7	2 5	1 7	3 18 4
8. Peas	1 13 1	0 16 7	0 11 1	7 5	4 11	3 3	2 2	1 5	0 11	2 7 9
9. Beans	1 18 7	0 19 4	0 12 11	8 7	5 9	3 10	2 7	1 9	1 2	2 15 11
10. Lentils	1 17 5	0 18 9	0 12 6	8 4	5 7	3 9	2 6	1 8	1 1	2 14 2
11. Tares (seed)	1 17 11	0 19 0	0 12 8	8 5	5 7	3 9	2 6	1 8	1 1	2 14 8
12. Indian corn	0 13 4	0 6 8	0 4 5	2 11	1 11	1 3	0 10	0 7	0 5	0 19 0
13. Wheat	0 15 8	0 7 10	0 5 3	3 6	2 4	1 7	1 1	0 9	0 6	1 2 10
14. Malt	0 14 5	0 7 3	0 4 10	3 3	2 2	1 5	0 11	0 7	0 5	1 0 10
15. Barley	0 14 0	0 7 0	0 4 8	3 1	2 1	1 5	0 11	0 7	0 5	1 0 2
16. Oats	0 16 8	0 8 4	0 5 7	3 9	2 6	1 8	1 1	0 9	0 6	1 4 2
17. Rice meal	0 15 5	0 7 9	0 5 2	3 5	2 3	1 6	1 0	0 8	0 5	1 2 2
18. Locust beans	—	—	—	—	—	—	—	—	—	—
19. Malt coombs	2 3 9	1 1 11	0 14 7	9 9	6 6	4 4	2 11	1 11	1 3	3 3 2
20. Fine pollard	1 12 0	0 16 0	0 10 8	7 1	4 9	3 2	2 1	1 5	0 11	2 6 1
21. Coarse pollard	1 15 2	0 17 7	0 11 9	7 10	5 3	3 6	2 4	1 7	1 1	2 10 11
22. Bran	1 15 11	0 18 0	0 12 0	8 0	5 4	3 7	2 5	1 7	1 1	2 12 0
DEDUCT ⅔ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅕ FROM YEAR TO YEAR										
One Ton										
23. Clover hay	1 5 5	0 8 6	0 6 10	5 6	4 5	3 6	2 10	2 3	1 10	1 15 8
24. Meadow hay	0 17 0	0 5 8	0 4 6	3 7	2 10	2 3	1 10	1 6	1 2	1 3 4
25. Pea straw	0 10 9	0 3 7	0 2 10	2 3	1 10	1 6	1 2	0 11	0 9	0 14 10
26. Oat straw	0 6 2	0 2 1	0 1 8	1 4	1 1	0 10	0 8	0 6	0 5	0 8 7
27. Wheat straw	0 5 5	0 1 10	0 1 6	1 2	0 11	0 9	0 7	0 6	0 5	0 7 8
28. Barley straw	0 5 6	0 1 10	0 1 6	1 2	0 11	0 9	0 7	0 6	0 5	0 7 8
29. Bean straw	0 10 4	0 3 5	0 2 9	2 2	1 9	1 5	1 2	0 11	0 9	0 14 4
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR										
Ten Tons										
30. Potatoes	1 17 6	0 18 9	0 12 6	8 4	5 7	3 9	2 6	1 8	1 1	2 14 2
31. Carrots	1 5 0	0 12 6	0 8 4	5 7	3 9	2 6	1 8	1 1	0 9	1 16 2
32. Parsnips	1 12 6	0 16 3	0 10 10	7 3	4 10	3 3	2 2	1 5	0 11	2 6 11
33. Mangel wurzels	1 10 0	0 15 0	0 10 0	6 8	4 5	2 11	1 11	1 3	0 10	2 3 0
34. Swedish turnips	1 7 6	0 13 9	0 9 2	6 1	4 1	2 9	1 10	1 3	0 10	1 19 9
35. Yellow turnips	1 3 4	0 11 8	0 7 9	5 2	3 5	2 3	1 6	1 0	0 8	1 13 5
36. White turnips	1 4 2	0 12 1	0 8 1	5 5	3 7	2 5	1 7	1 1	0 9	1 15 0

TABLE V.—*Estimates of the Compensation-value of the Unexhausted Manures when Foods are consumed for the Production of Milk, starting from the Total or Original Manure-value.*

2. Assuming a yield of 8 quarts of milk per head per day.

Foods	Total or original manure-value, deducting constituents in milk only	Compensation-value of unexhausted manures							
		Last year	Second year	Third year	Fourth year	Fifth year	Sixth year	S'v'nth year	Eighth year	Total
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR										
One Ton	£ s. d.	£ s. d.	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.
1. Linseed . .	1 12 0	0 16 0	0 10 8	7 1	4 9	3 2	2 1	1 5	0 11	2 6 1
2. Linseed cake .	2 6 0	1 3 0	0 15 4	10 3	6 10	4 7	3 1	2 1	1 5	3 6 7
3. Decorticated cotton cake	3 9 2	1 14 7	1 3 1	15 5	10 3	6 10	4 7	3 1	2 1	4 19 11
4. Palm-nut cake	1 1 4	0 10 8	0 7 1	4 9	3 2	2 1	1 5	0 11	0 7	1 10 8
5. Undecortic't'd cotton cake	2 0 8	1 0 4	0 13 7	9 1	6 1	4 1	2 9	1 10	1 3	2 19 0
6. Cocoa-nut cake	1 15 3	0 17 8	0 11 9	7 10	5 3	3 6	2 4	1 7	1 1	2 11 0
7. Rape cake .	2 12 11	1 6 6	0 17 8	11 9	7 10	5 3	3 6	2 4	1 7	3 16 5
8. Peas . .	1 11 2	0 15 7	0 10 5	6 11	4 7	3 1	2 1	1 5	0 11	2 5 0
9. Beans . .	1 16 10	0 18 5	0 12 3	8 2	5 5	3 7	2 5	1 7	1 1	2 12 11
10. Lentils . .	1 15 7	0 17 10	0 11 11	7 11	5 3	3 6	2 4	1 7	1 1	2 11 5
11. Tares (seed) .	1 16 0	0 18 0	0 12 0	8 0	5 4	3 7	2 5	1 7	1 1	2 12 0
12. Indian corn .	0 11 7	0 5 10	0 3 11	2 7	1 9	1 2	0 9	0 6	0 4	0 16 10
13. Wheat . .	0 13 11	0 7 0	0 4 8	3 1	2 1	1 5	0 11	0 7	0 5	1 0 2
14. Malt . .	0 12 7	0 6 4	0 4 3	2 10	1 11	1 3	0 10	0 7	0 5	0 18 5
15. Barley . .	0 12 3	0 6 2	0 4 1	2 9	1 10	1 3	0 10	0 7	0 5	0 17 11
16. Oats . .	0 15 0	0 7 6	0 5 0	3 4	2 3	1 6	1 0	0 8	0 5	1 1 8
17. Rice meal .	0 13 9	0 6 11	0 4 7	3 1	2 1	1 5	0 11	0 7	0 5	1 0 0
18. Locust beans .	—	—	—	—	—	—	—	—	—	—
19. Malt coombs .	2 2 0	1 1 0	0 14 0	9 4	6 3	4 2	2 9	1 10	1 3	3 0 7
20. Fine pollard .	1 10 5	0 15 3	0 10 2	6 9	4 6	3 0	2 0	1 4	0 11	2 3 11
21. Coarse pollard .	1 13 6	0 16 9	0 11 2	7 5	4 11	3 3	2 2	1 5	0 11	2 8 0
22. Bran . .	1 14 6	0 17 3	0 11 6	7 8	5 1	3 5	2 3	1 6	1 0	2 9 8
DEDUCT ⅔ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅕ FROM YEAR TO YEAR										
One Ton										
23. Clover hay .	1 4 5	0 8 2	0 6 6	5 2	4 2	3 4	2 8	2 2	1 9	1 13 11
24. Meadow hay .	0 16 3	0 5 5	0 4 4	3 6	2 10	2 3	1 10	1 6	1 2	1 2 10
25. Pea straw .	0 10 0	0 3 4	0 2 8	2 2	1 9	1 5	1 2	0 11	0 9	0 14 2
26. Oat straw .	0 5 5	0 1 10	0 1 6	1 2	0 11	0 9	0 7	0 6	0 5	0 7 8
27. Wheat straw .	0 4 10	0 1 7	0 1 3	1 0	0 10	0 8	0 6	0 5	0 4	0 6 7
28. Barley straw .	0 4 10	0 1 7	0 1 3	1 0	0 10	0 8	0 6	0 5	0 4	0 6 7
29. Bean straw .	0 9 9	0 3 3	0 2 7	2 1	1 8	1 4	1 1	0 10	0 8	0 13 6
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR										
Ten Tons										
30. Potatoes . .	1 15 0	0 17 6	0 11 8	7 9	5 2	3 5	2 3	1 6	1 0	2 10 3
31. Carrots . .	1 3 4	0 11 8	0 7 9	5 2	3 5	2 3	1 6	1 0	0 8	1 13 5
32. Parsnips . .	1 10 10	0 15 5	0 10 3	6 10	4 7	3 1	2 1	1 5	0 11	2 4 7
33. Mangel wurzels	1 8 4	0 14 2	0 9 5	6 3	4 2	2 9	1 10	1 3	0 10	2 0 8
34. Swedish turnips	1 6 8	0 13 4	0 8 11	5 11	3 11	2 7	1 9	1 2	0 9	1 18 4
35. Yellow turnips	1 2 6	0 11 3	0 7 6	5 0	3 4	2 3	1 6	1 0	0 8	1 12 6
36. White turnips .	1 3 4	0 11 8	0 7 9	5 2	3 5	2 3	1 6	1 0	0 8	1 13 5

TABLE VI.—*Estimates of the Compensation-value of the Unexhausted Manures when Foods are consumed for the Production of Milk, starting from the Total or Original Manure-value.*

3. Assuming a yield of 10 quarts of milk per head per day.

Foods	Total or original manure-value, deducting constituents in milk only	Compensation-value of unexhausted manures																					
		Last year			Second year			Third year			Fourth year			Fifth year			Sixth year			S'v'nth year			Eighth year			Total		
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR																											
One Ton	£	s.	d.	£	s.	d.	£	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	£	s.	d.
1. Linseed	1	9	6	0	14	9	0	9	10	6	7	4	5	2	11	1	11	1	3	0	10	2	2	2
2. Linseed cake	2	3	10	1	1	11	0	14	7	9	9	6	6	4	4	2	11	1	11	1	3	3	3	2
3. Decorticated cotton cake	3	7	4	1	13	8	1	2	5	14	11	9	11	6	7	4	5	2	11	1	11	4	16	9
4. Palm-nut cake	0	19	5	0	9	9	0	6	6	4	4	2	11	1	11	1	3	0	10	0	7	1	8	1
5. Undecortic't'd cotton cake	1	19	2	0	19	7	0	13	1	8	9	5	10	3	11	2	7	1	9	1	2	2	16	8
6. Cocoa-nut cake	1	13	9	0	16	11	0	11	3	7	6	5	0	3	4	2	3	1	6	1	0	2	8	9
7. Rape cake	2	11	7	1	5	10	0	17	3	11	6	7	8	5	1	3	5	2	3	1	6	3	14	6
8. Peas	1	9	6	0	14	9	0	9	10	6	7	4	5	2	11	1	11	1	3	0	10	2	2	6
9. Beans	1	14	11	0	17	6	0	11	8	7	9	5	2	3	5	2	3	1	6	1	0	2	10	3
10. Lentils	1	13	9	0	16	11	0	11	3	7	6	5	0	3	4	2	3	1	6	1	0	2	8	9
11. Tares (seed)	1	14	2	0	17	1	0	11	5	7	7	5	1	3	5	2	3	1	6	1	0	2	9	4
12. Indian corn	0	9	11	0	5	0	0	3	4	2	3	1	6	1	0	0	8	0	5	0	3	0	14	5
13. Wheat	0	12	1	0	6	1	0	4	1	2	9	1	10	1	3	0	10	0	7	0	5	0	17	10
14. Malt	0	10	8	0	5	4	0	3	7	2	5	1	7	1	1	0	9	0	6	0	4	0	15	7
15. Barley	0	10	6	0	5	3	0	3	6	2	4	1	7	1	1	0	9	0	6	0	4	0	15	4
16. Oats	0	13	4	0	6	8	0	4	5	2	11	1	11	1	3	0	10	0	7	0	5	0	19	0
17. Rice meal	0	12	0	0	6	0	0	4	0	2	8	1	9	1	2	0	9	0	6	0	4	0	17	2
18. Locust beans	—			—			—			—		—		—		—		—		—		—			—		
19. Malt coombs	2	0	6	1	0	3	0	13	6	9	0	6	0	4	0	2	8	1	9	1	2	2	18	4
20. Fine pollard	1	8	8	0	14	4	0	9	7	6	5	4	3	2	10	1	11	1	3	0	10	2	1	5
21. Coarse pollard	1	12	0	0	16	0	0	10	8	7	1	4	9	3	2	2	1	1	5	0	11	2	6	1
22. Bran	1	13	1	0	16	7	0	11	1	7	5	4	11	3	3	2	2	1	5	0	11	2	7	9
DEDUCT ⅔ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅕ FROM YEAR TO YEAR																											
One Ton																											
23. Clover hay	1	3	7	0	7	10	0	6	3	5	0	4	0	3	2	2	6	2	0	1	7	1	12	4
24. Meadow hay	0	15	5	0	5	2	0	4	2	3	4	2	8	2	2	1	9	1	5	1	2	1	1	10
25. Pea straw	0	9	3	0	3	1	0	2	6	2	0	1	7	1	3	1	0	0	10	0	8	0	12	11
26. Oat straw	0	4	9	0	1	7	0	1	3	1	0	0	10	0	8	0	6	0	5	0	4	0	6	7
27. Wheat straw	0	4	2	0	1	5	0	1	2	0	11	0	9	0	7	0	6	0	5	0	4	0	6	1
28. Barley straw	0	4	4	0	1	5	0	1	2	0	11	0	9	0	7	0	6	0	5	0	4	0	6	1
29. Bean straw	0	9	2	0	3	1	0	2	6	2	0	1	7	1	3	1	0	0	10	0	8	0	12	11
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR																											
Ten Tons																											
30. Potatoes	1	12	6	0	16	3	0	10	10	7	3	4	10	3	3	2	2	1	5	0	11	2	6	11
31. Carrots	1	2	6	0	11	3	0	7	6	5	0	3	4	2	3	1	6	1	0	0	8	1	12	6
32. Parsnips	1	8	4	0	14	2	0	9	5	6	3	4	2	2	9	1	10	1	3	0	10	2	0	8
33. Mangel wurzels	1	7	6	0	13	9	0	9	2	6	1	4	1	2	9	1	10	1	3	0	10	1	19	9
34. Swedish turnips	1	5	10	0	12	11	0	8	7	5	9	3	10	2	7	1	9	1	2	0	9	1	17	4
35. Yellow turnips	1	1	8	0	10	10	0	7	3	4	10	3	3	2	2	1	5	0	11	0	7	1	11	3
36. White turnips	1	2	6	0	11	3	0	7	6	5	0	3	4	2	3	1	6	1	0	0	8	1	12	6

TABLE VII.—*Estimates of the Compensation-value of the Unexhausted Manures when Foods are consumed for the Production of Milk, starting from the Total or Original Manure-value.*

4. Assuming a yield of 12 quarts of milk per head per day.

Foods	Total or original manure-value, deducting constituents in milk only	Compensation-value of unexhausted manures								
		Last year	Second year	Third year	Fourth year	Fifth year	Sixth year	S'v'nth year	Eighth year	Total
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR										
One Ton	£ s. d	£ s. d.	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.
1. Linseed . .	1 7 1	0 13 7	0 9 1	6 1	4 1	2 9	1 10	1 3	0 10	1 19 6
2. Linseed cake .	2 1 9	1 0 11	0 13 11	9 3	6 2	4 1	2 9	1 10	1 3	3 0 2
3. Decorticated cotton cake	3 5 4	1 12 8	1 1 9	14 6	9 8	6 5	4 3	2 10	1 11	4 14 0
4. Palm-nut cake	0 17 9	0 8 11	0 5 11	3 11	2 7	1 9	1 2	0 9	0 6	1 5 6
5. Undecortic't'd cotton cake	1 17 6	0 18 9	0 12 6	8 4	5 7	3 9	2 6	1 8	1 1	2 14 2
6. Cocoa-nut cake	1 12 3	0 16 2	0 10 9	7 2	4 9	3 2	2 1	1 5	0 11	2 6 5
7. Rape cake .	2 10 4	1 5 2	0 16 9	11 2	7 5	4 11	3 3	2 2	1 5	3 12 3
8. Peas . .	1 7 8	0 13 10	0 9 3	6 2	4 1	2 9	1 10	1 3	0 10	2 0 0
9. Beans . .	1 13 1	0 16 7	0 11 1	7 5	4 11	3 3	2 2	1 5	0 11	2 7 9
10. Lentils . .	1 12 2	0 16 1	0 10 9	7 2	4 9	3 2	2 1	1 5	0 11	2 6 4
11. Tares (seed) .	1 12 6	0 16 3	0 10 10	7 3	4 10	3 3	2 2	1 5	0 11	2 6 11
12. Indian corn .	0 8 1	0 4 1	0 2 9	1 10	1 3	0 10	0 7	0 5	0 3	0 12 0
13. Wheat . .	0 10 5	0 5 3	0 3 6	2 4	1 7	1 1	0 9	0 6	0 4	0 15 4
14. Malt . .	0 9 0	0 4 6	0 3 0	2 0	1 4	0 11	0 7	0 5	0 3	0 13 0
15. Barley . .	0 8 8	0 4 4	0 2 11	1 11	1 3	0 10	0 7	0 5	0 3	0 12 6
16. Oats . .	0 11 7	0 5 10	0 3 11	2 7	1 9	1 2	0 9	0 6	0 4	0 16 10
17. Rice meal .	0 10 5	0 5 3	0 3 6	2 4	1 7	1 1	0 9	0 6	0 4	0 15 4
18. Locust beans .	—	—	—	—	—	—	—	—	—	—
19. Malt coombs .	1 18 11	0 19 6	0 13 0	8 8	5 9	3 10	2 7	1 9	1 2	2 16 3
20. Fine pollard .	1 6 11	0 13 6	0 9 0	6 0	4 0	2 8	1 9	1 2	0 9	1 18 10
21. Coarse pollard	1 10 5	0 15 3	0 10 2	6 9	4 6	3 0	2 0	1 4	0 11	2 3 11
22. Bran . .	1 11 8	0 15 10	0 10 7	7 1	4 9	3 2	2 1	1 5	0 11	2 5 10
DEDUCT ⅔ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅕ FROM YEAR TO YEAR										
One Ton										
23. Clover hay .	1 2 8	0 7 7	0 6 1	4 10	3 10	3 1	2 6	2 0	1 7	1 11 6
24. Meadow hay .	0 14 5	0 4 10	0 3 10	3 1	2 6	2 0	1 7	1 3	1 0	1 0 1
25. Pea straw .	0 8 5	0 2 10	0 2 3	1 10	1 6	1 2	0 11	0 9	0 7	0 11 10
26. Oat straw .	0 4 0	0 1 4	0 1 1	0 10	0 8	0 6	0 5	0 4	0 3	0 5 5
27. Wheat straw .	0 3 6	0 1 2	0 0 11	0 9	0 7	0 6	0 5	0 4	0 3	0 4 11
28. Barley straw .	0 3 9	0 1 3	0 1 0	0 10	0 8	0 6	0 5	0 4	0 3	0 5 3
29. Bean straw .	0 8 7	0 2 10	0 2 3	1 10	1 6	1 2	0 11	0 9	0 7	0 11 10
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR										
Ten Tons										
30. Potatoes . .	1 10 10	0 15 5	0 10 3	6 10	4 7	3 1	2 1	1 5	0 11	2 4 7
31. Carrots . .	1 0 10	0 10 5	0 6 11	4 7	3 1	2 1	1 5	0 11	0 7	1 10 0
32. Parsnips .	1 6 8	0 13 4	0 8 11	5 11	3 11	2 7	1 9	1 2	0 9	1 18 4
33. Mangel wurzels	1 5 10	0 12 11	0 8 7	5 9	3 10	2 7	1 9	1 2	0 9	1 17 4
34. Swedish turnips	1 4 2	0 12 1	0 8 1	5 5	3 7	2 5	1 7	1 1	0 9	1 15 0
35. Yellow turnips	1 0 10	0 10 5	0 6 11	4 7	3 1	2 1	1 5	0 11	0 7	1 10 0
36. White turnips .	1 1 8	0 10 10	0 7 3	4 10	3 3	2 2	1 5	0 11	0 7	1 11 3

TABLE VIII.—*Estimates of the Compensation-value of the Unexhausted Manures when Foods are consumed for the Production of Milk, starting from the Total or Original Manure-value.*

5. Assuming a yield of 14 quarts of milk per head per day.

Foods	Total or original manure-value, deducting constituents in milk only	Compensation-value of unexhausted manures																					
		Last year			Second year			Third year			Fourth year			Fifth year			Sixth year			S'v'nth year			Eighth year			Total		
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR																											
One Ton	£ s. d.	£	s.	d.	£	s.	d.	s.	d.		s.	d.		s.	d.		s.	d.		s.	d.		s.	d.		£	s.	d.
1. Linseed . .	1 4 5	0	12	3	0	8	2	5	5		3	7		2	5		1	7		1	1		0	9		1	15	3
2. Linseed cake .	1 19 8	0	19	10	0	13	3	8	10		5	11		3	11		2	7		1	9		1	2		2	17	3
3 { Decorticated cotton cake }	3 3 4	1	11	8	1	1	1	14	1		9	5		6	3		4	2		2	9		1	10		4	11	3
4. Palm-nut cake	0 15 11	0	8	0	0	5	4	3	7		2	5		1	7		1	1		0	9		0	6		1	3	3
5 { Undecortic't'd cotton cake }	1 15 11	0	18	0	0	12	0	8	0		5	4		3	7		2	5		1	7		1	1		2	12	0
6. Cocoa-nut cake	1 10 6	0	15	3	0	10	2	6	9		4	6		3	0		2	0		1	4		0	11		2	3	11
7. Rape cake .	2 9 1	1	4	7	0	16	5	10	11		7	3		4	10		3	3		2	2		1	5		3	10	10
8. Peas . .	1 5 9	0	12	11	0	8	7	5	9		3	10		2	7		1	9		1	2		0	9		1	17	4
9. Beans . .	1 11 4	0	15	8	0	10	5	6	11		4	7		3	1		2	1		1	5		0	11		2	5	1
10. Lentils . .	1 10 1	0	15	1	0	10	1	6	9		4	6		3	0		2	0		1	4		0	11		2	3	8
11. Tares (seed) .	1 10 7	0	15	4	0	10	3	6	10		4	7		3	1		2	1		1	5		0	11		2	4	6
12. Indian corn .	0 6 5	0	3	3	0	2	2	1	5		0	11		0	7		0	5		0	3		0	2		0	9	2
13. Wheat . .	0 8 8	0	4	4	0	2	11	1	11		1	3		0	10		0	7		0	5		0	3		0	12	6
14. Malt . .	0 7 1	0	3	7	0	2	5	1	7		1	1		0	9		0	6		0	4		0	3		0	10	6
15. Barley . .	0 6 11	0	3	6	0	2	4	1	7		1	1		0	9		0	6		0	4		0	3		0	10	4
16. Oats . .	0 9 10	0	4	11	0	3	3	2	2		1	5		0	11		0	7		0	5		0	3		0	13	11
17. Rice meal .	0 8 7	0	4	4	0	2	11	1	11		1	3		0	10		0	7		0	5		0	3		0	12	6
18. Locust beans .	—		—			—		—			—			--			—			--			—				—	
19. Malt coombs .	1 17 4	0	18	8	0	12	5	8	3		5	6		3	8		2	5		1	7		1	1		2	13	7
20. Fine pollard .	1 5 3	0	12	8	0	8	5	5	7		3	9		2	6		1	8		1	1		0	9		1	16	5
21. Coarse pollard	1 8 9	0	14	5	0	9	7	6	5		4	3		2	10		1	11		1	3		0	10		2	1	6
22. Bran . .	1 10 3	0	15	2	0	10	1	6	9		4	6		3	0		2	0		1	4		0	11		2	3	9
DEDUCT ⅔ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅕ FROM YEAR TO YEAR																											
One Ton																											
23. Clover hay .	1 1 8	0	7	3	0	5	10	4	8		3	10		3	1		2	6		2	0		1	7		1	10	9
24. Meadow hay .	0 13 7	0	4	6	0	3	7	2	10		2	3		1	10		1	6		1	2		0	11		0	18	7
25. Pea straw .	0 7 8	0	2	7	0	2	1	1	8		1	4		1	1		0	10		0	8		0	6		0	10	9
26. Oat straw .	0 3 3	0	1	1	0	0	10	0	8		0	6		0	5		0	4		0	3		0	2		0	4	3
27. Wheat straw .	0 3 0	0	1	0	0	0	10	0	8		0	6		0	5		0	4		0	3		0	2		0	4	2
28. Barley straw .	0 3 2	0	1	1	0	0	10	0	8		0	6		0	5		0	4		0	3		0	2		0	4	3
29. Bean straw .	0 8 0	0	2	8	0	2	2	1	9		1	5		1	2		0	11		0	9		0	7		0	11	5
DEDUCT ½ OF ORIGINAL MANURE-VALUE THE LAST YEAR, AND ⅓ FROM YEAR TO YEAR																											
Ten Tons																											
30. Potatoes . .	1 9 2	0	14	7	0	9	9	6	6		4	4		2	11		1	11		1	3		0	10		2	2	1
31. Carrots . .	0 19 2	0	9	7	0	6	5	4	3		2	10		1	11		1	3		0	10		0	7		1	7	8
32. Parsnips . .	1 5 10	0	12	11	0	8	7	5	9		3	10		2	7		1	9		1	2		0	9		1	17	4
33. Mangel wurzels	1 4 2	0	12	1	0	8	1	5	5		3	7		2	5		1	7		1	1		0	9		1	15	0
34. Swedish turnips	1 2 6	0	11	3	0	7	6	5	0		3	4		2	3		1	6		1	0		0	8		1	12	6
35. Yellow turnips	1 0 0	0	10	0	0	6	8	4	5		2	11		1	11		1	3		0	10		0	7		1	8	7
36. White turnips .	1 0 0	0	10	0	0	6	8	4	5		2	11		1	11		1	3		0	10		0	7		1	8	7

for washing, and it may be that a good deal of the manure is washed into drains and lost. In the event, therefore, of a claim for compensation, the management and disposal of the manure requires the attention of the valuer. Indeed, the varying circumstances that will arise in practice must be carefully considered. Bearing these in mind, the estimates may be accepted as at any rate the best approximation to the truth that existing knowledge enables us to provide; and they will, we hope, be found sufficient for the requirements of practical use. Obviously, they will be more directly applicable in the case of cows feeding entirely on the foods enumerated in the list, and not depending largely on grass; but even when the animals are partially grass-fed, the value of the manure derived from the additional dry food, or roots, may be estimated according to the scale given.

For any further particulars relating to the general question of the valuation of the manures obtained by the consumption of food-stuffs, we must refer to the full discussion of the subject in our paper in the last number of the Journal.

Rothamsted.

John Bennet Lawes.
J. Henry Gilbert.

PRINTED BY
SPOTTISWOODE AND CO., NEW-STREET SQUARE
LONDON

3 0112 061965643